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PREFORMED DIVERTERS AND DIVERTER SYSTEM FOR BUILDING FOUNDATIONS

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PREFORMED DIVERTERS AND DIVERTER SYSTEM FOR BUILDING FOUNDATIONS

FIELD OF THE INVENTION

This invention relates generally to building foundations, and more particularly to a diverter for directing water away from a building foundation.

BACKGROUND OF THE INVENTION

Damaged foundations resulting from frost heave or wet basements and crawl spaces are a persistent and widespread problem, especially in geographical regions that are prone to large amounts of rainfall. Building foundations are susceptible to leakage when the soil surrounding the foundation becomes saturated with rainwater. Flooded and wet basements and crawl spaces, as well as wetness beneath slabs, may contribute to property damage. Standing water and humidity resulting from leakage contribute to the growth of harmful microorganisms, such as dust mites and mold, which may produce allergens, toxins, irritants and unwanted odors. Additionally, in post and pier foundation, frost heave is a particular nuisance that may result in cracked and damaged foundations in climates with freezing weather.

Saturated soil typically results from the direct rainfall on and around a structure, as well as from runoff from surrounding lots and structures which may

be uphill from a particular structure. Conventional methods for preventing leakage of water into basements and crawl spaces include the construction of a surface or sub-surface drainage system. With a surface system, the type of soil utilized should be relatively impermeable and graded to a visible slope away from the structure, which typically is at least one-half inch per foot. With a sub-surface system the rainwater typically is drained to a buried pipe, which must remain unclogged and effective whether it drains to a sump pump, municipal storm system or ambient atmosphere.

However, even under ideal conditions where drainage systems are operating normally, some water can accumulate in the soil surrounding a structure. Thus, in addition to drainage, foundation walls typically are "damproofed" with a coating of bitumen and/or a layer of plastic placed beneath the concrete floor slab to retard movement of water vapor into the building. Furthermore, as a backup, a sump pump often is installed to collect and discharge any water that may accumulate in the soil or gravel beneath the floor slab. Such methods, however, are not effective when the soil surrounding the foundation is saturated.

SUMMARY OF THE INVENTION

The instant invention is directed to a system of one or more preformed diverters for directing water away from a building foundation having a generally vertical section with a first predetermined width and an angled section

having a second predetermined width and being angled downwardly and away from both the vertical section and the building foundation.

BRIEF DESCRIPTION OF THE DRAWINGS

Other features, objects and advantages of the invention will be apparent by reference to the drawings, of which:

FIGURE 1 is a front perspective view of an exemplary house and foundation with a preferred embodiment diverter system of the instant invention;

FIG. 2 is side perspective view of an outside corner of an exemplary house and foundation with a preferred embodiment outside corner unit and a preferred embodiment generally planar unit of the instant invention;

FIG. 3 is a side perspective view of a preferred embodiment outside corner unit of the instant invention coupled to a building foundation;

FIG. 4 is a side elevational view of a preferred embodiment outside corner unit of the instant invention;

FIG. 5 is a side elevational view of a preferred embodiment inside corner unit of the instant invention;

FIG. 6 is a side elevational view of a preferred embodiment generally planar unit of the instant invention;

FIG. 7A is a top elevational view of the sheet of material from which a preferred embodiment outside unit may be formed;

FIG. 7B is a side elevational view of the assembly of a preferred embodiment outside corner unit;

FIG. 7C is a top elevational view of the sheet of material from which a preferred embodiment inside corner unit may be formed;

FIG. 8A is a side perspective view of a preferred embodiment outside corner unit;

FIG. 8B is a side perspective view of a preferred embodiment inside corner unit of the instant invention;

FIG. 9A is a front perspective view of a post foundation coupled to a post unit;

FIG. 9B is a front perspective view of a pier foundation coupled to a plurality of outside corner units; and

FIG. 10 is a side elevational view of an outside corner unit of an embodiment of the instant invention.

DETAILED DESCRIPTION OF THE INVENTION

The instant invention is directed to a system that diverts water away from a building foundation that includes one or more preformed diverters that are configured for on-site installation, and which are shaped to at least partially abut the building foundation and divert water away therefrom. Buildings and their foundations are constructed to assume a wide variety of architectural shapes, and accordingly, the system of the instant invention includes preformed diverters that

readily accommodate the various corners and planar surfaces included in the structure of a building and its foundation. More specifically, the instant invention includes a plurality of preformed diverters having predetermined shapes that accommodate inside corners and outside corners of a foundation, as well as the generally planar wall surfaces of a foundation. Additionally, the instant invention contemplates that preformed diverters may be provided for a vast array of foundation shapes, including but not limited to radiused foundations, such as round foundations, or polygonal foundations, such as pentagonal, hexagonal, heptagonal, or octagonal foundations, or corners having angles of greater than or less than 90°.

For purposes of illustration, FIG. 1 illustrates an exemplary house 10 constructed atop a foundation 12. In addition to generally planar wall surfaces 14, the illustrated house 10 includes two kinds of corners: outside corners 16 and inside corners 18. Outside corners 16 are corners are corners where walls meet to form an interior angle, which is an angle facing the interior of the structure, of approximately less than 180°, for example a 90°. Conversely, inside corners 18 are corners where walls meet to an internal angle of greater than 180°, for example 270°. Typically, the foundation 12 underlying the house 10 corresponds to the shape of the house, and will accordingly include corresponding outside corners 16 and inside corners 18.

Thus, as illustrated in FIGs. 4, 5 and 6, the diverter system of the instant invention includes a plurality of preformed diverter units, more specifically

an outside corner unit 24, an inside corner unit 26, and a generally planar unit 28. Once dimensions are specified for the diverter units 24, 26, 28, diverter units may be preformed in a customized configuration to accommodate a specified foundational shape and size. Each of the diverter units 24, 26, 28 includes a generally vertical section 30 and an angled section 32 that are preferably of unitary construction, but which may optionally be assembled from multiple sub-units and subsequently sealed to prevent leakage. Additionally, the dimensions of the respective vertical sections 30 and angled sections 32 may vary from unit to unit.

Turning now to FIGs. 2, 3 and 4, the outside corner unit 24 includes a preferably unitary diverter body generally shaped to fit closely to the outside corners 16 of the building foundation 12. Accordingly, the generally vertical section 30 of the outside corner unit 24 is generally L-shaped and includes first and second portions 34, 36 that are disposed at an angle with respect to one another. For purposes of illustration only, the first and second portions 34, 36 are disposed at a right angle in FIGs. 2, 3, and 4. However, as illustrated in FIG. 8A, the first and second portions 34, 36 may be disposed at other angles as well. The angle of abutment 38 in the instant embodiment, which is the angle defined by the surfaces of the generally vertical section 30 that are configured to abut the foundation 12, is approximately 90°. However, as illustrated in FIG. 8A, the angle of abutment 39 is approximately 135°.

The outside corner unit 24 also includes the angled portion 32. In the outside corner unit 24, the angled portion 32 extends downwardly and away

from both the vertical section 30 and the building foundation 12. The angled portion 32 is preferably unitary with the vertical section 30, and extends from the vertical section preferably at a grade of approximately 20%. While the angled portion 32 may assume a variety of configurations, the preferred embodiment includes an angled portion having two planar surfaces 40, 42 that are angled with respect to one another so that a longitudinal peak 44 is formed on a common side of the planar surfaces. In alternative embodiments, where the two planar surfaces 40, 42 may be assembled from multiple sub-units, the longitudinal peak 44 may form a junction between sub-units. This configuration eliminates the possibility that water in the surrounding soil could pool within the outside corner unit 24. Thus, water in the surrounding soil first encounter one of the planar surfaces 40, 42 and owing to the angle at which the planar surfaces are disposed, will be forced downwardly on either side of the planar surfaces and away from the foundation.

Both the vertical section 30 and the angled section 32 include predetermined dimensions, with the width of the vertical section preferably being at least slightly smaller than that of the angled section. For example, while dimensions may be varied to suit individual applications, the preferred vertical section 30 of the outside corner unit 24 has a predetermined width of approximately ten inches, a predetermined thickness of approximately 0.045 inches (1 mm), and each of the first and second portions 34, 36 have a predetermined length of approximately 24 inches. Typically, a ratio of the widths

of the vertical section 30 and the angled section 32 are preferably between approximately 1:1 and 1:10.

Similarly, while the dimensions of the angled section 32 may vary to suit individual applications, the preferred angled section has a length of approximately 30 inches. As illustrated in FIG. 4, there is a shared boundary between the vertical section 30 and each of the planar surfaces 40, 42, and as such, the length of each of the planar surfaces will preferably correspond to that of each of the first and second portions 34, 36 of the vertical section 30, which in the preferred embodiment is approximately 24 inches. Also, because the vertical section 30 and the angled section 32 are preferably unitary and constructed from a single sheet of composite material, the thickness is typically uniform throughout both the vertical section and the angled section.

Turning now to FIG. 5, the inside corner unit 26 includes a unitary diverter body generally shaped to fit closely to the inside corners 18 of the building foundation 12. Therefore, the generally vertical section 30 of the inside corner unit 26 is generally L-shaped and includes first and second portions 44, 46 that are disposed at an angle with respect to one another. For purposes of illustration only, the first and section portions 44, 46 of the instant embodiment are illustrated at a right angle with respect to one another in FIG. 5. However, the angle at which the first and second portions 44, 46 are oriented with respect to one another may vary to suit individual applications, as illustrated in FIG. 8B where the angle of abutment 47 is approximately 225°. The angle of abutment 48 for

the vertical section 30 of the inside corner unit 26 is generally the inverse of that of the outside corner unit 24. As such, the angle of abutment 48 for the inside corner unit 26 illustrated in FIG. 5 is approximately 270°.

Like the outside corner unit 24, the inside corner unit 26 also includes the angled portion 32. In the inside corner unit 26, the angled portion 32 extends downwardly and away from both the vertical section 30 and the building foundation 12 preferably at a grade of approximately 20%. The angled portion 32 is preferably unitary with the vertical section 30, and extends at an obtuse angle from the vertical section. While the angled portion 32 may assume a variety of configurations, the preferred embodiment wherein the angle of abutment 48 is approximately 270° includes an angled portion having three generally triangular planar surfaces 50, 52, 54 that are generally isosceles in shape, each having a base 56 and two equal sides 58. The planar surfaces 50, 52, 54 are angled with respect to one another so that a pair of longitudinal valleys 60 is formed. In alternative embodiments wherein the planar surfaces 50, 52, 54 are assembled from multiple sub-units, the longitudinal valleys 60 may form the junction between the planar surfaces. This configuration reduces the possibility that water in the surrounding soil could pool within the inside corner unit 26 because water in the surrounding soil first encounters one of the planar surfaces 50, 52, 54, and owing to the angle at which the planar surfaces are disposed, will then be forced downwardly into one of the longitudinal valleys 60 and away from the foundation 12.

However, as FIG. 8B illustrates, three planar surfaces are not necessary. In the embodiment illustrated in FIG. 8B, where the angle of abutment 47 is approximately 315°, only two planar surfaces 61a, 61b are provided.

Both the vertical section 30 and the angled section 32 include predetermined dimensions, with the width of the vertical section preferably being at least slightly smaller than that of the angled section. Typically, a ratio of the widths of the vertical section 30 and the angled section 32 are preferably between approximately 1:1 and 1:10.

For example, while dimensions may be varied to suit individual applications, the preferred vertical section 30 of the inside corner unit 26 has a predetermined width of approximately ten inches, a predetermined thickness of approximately 0.045 inches, and each of the first and second portions 44, 46 have a predetermined length of approximately 44 inches.

Similarly, while the dimensions of the angled section 32 may vary to suit individual applications, the two outside planar surfaces 50, 54 of the preferred angled section have a base length of approximately 30 inches. The center planar surface 52 has a base length of approximately 53 inches. As illustrated in FIG. 5, there is a shared boundary between the vertical section 30 and the two outside planar surfaces 50, 54. As such, the length of each of those planar surfaces 50, 54 will preferably correspond to that of each of the first and second portions 44, 46 of the vertical section 30, which in the preferred embodiment is approximately 44 inches. Also, because the vertical section 30 and the angled section 32 are

preferably unitary and constructed from a single sheet of composite material, the thickness is typically uniform throughout both the vertical section and the angled section.

The generally planar unit 28, illustrated in FIG.6, is dimensioned and configured to abut the planar wall surfaces 14 included in the structure of a building and its foundation. The planar unit 28 preferably includes a unitary diverter body generally shaped to fit closely to the planar wall surfaces 14 of the building foundation 12. However, as with both the inside and outside corner units 24, 26, alternative embodiments of the planar unit 28 may include multiple sub-units that are subsequently assembled into a preformed unit. Therefore, the generally vertical section 30 of the planar unit 28 is generally planar and has an angle of abutment 62 of approximately 180°.

Like both the outside and inside corner units 24, 26 the planar unit 28 also includes the angled portion 32. The angled portion 32 similarly extends downwardly and away from both the vertical section 30 and the building foundation 12. The angled portion 32 is unitary with the vertical section 30, and extends downwardly preferably at a grade of approximately 20%. However, unlike the other two units 24, 26, the angled portion 32 of the preferred embodiment includes a single generally rectangular, generally planar surface 64. This configuration also eliminates the possibility that water in the surrounding soil could pool within the planar unit 28 because there is no surface on which water

could collect. Rather, water will follow the path of least resistance and flow downwardly along the generally planar surface 62.

Both the vertical section 30 and the angled section 32 include predetermined dimensions, with the width of the vertical section preferably being at least slightly smaller than that of the angled section. Typically, a ratio of the widths of the vertical section 30 and the angled section 32 are preferably between approximately 1:1 and 1:10.

For example, while dimensions may be varied to suit individual applications, the preferred vertical section 30 of the planar unit 28 has a predetermined width of approximately ten inches, a predetermined thickness of approximately 0.045 inches, and a predetermined length of approximately 27 inches. When a plurality of planar units 28 are installed, they are installed so that at least a portion of one unit overlaps at least a portion of the adjacent unit, thereby preventing any unprotected surfaces. Thus, in the preferred embodiment, the 27 inch length anticipates that as much as 1 ½ inches on either side of the vertical section 30 may be obscured by the adjacent unit 28, leaving only approximately 24 inches exposed.

However, the predetermined length may optionally be configured to include any predetermined measurement designated by an end user, preferably measured in a discrete unit such as, for example, inches, feet, yards, centimeters and meters. For example, an end user may desire a few larger units rather than many smaller units, and may accordingly specify units measuring from between 3

and 12 feet, or any similar measurement. Alternatively, an end user may, for example, specify two corner units (outside corner units 24, inside corner units 26 or a combination of both) and a single planar 28 unit having a predetermined length to span the distance between the corner units. Thus, the instant invention contemplates providing a bolt of material having a predetermined length, that is either rolled or folded for delivery to the end user, which is subsequently installed.

Similarly, while the dimensions of the angled section 32 may vary to suit individual applications, the planar surface 62 of the preferred angled section has a length of approximately 30 inches. There is a shared boundary between the vertical section 30 and the planar surface 62, whether unitary or composed of multiple sub-units. As such, the width of the planar surface 62 will preferably correspond to that of the vertical section 30, which in the preferred embodiment is approximately 27 inches. Also, when the vertical section 30 and the angled section 32 are unitary and constructed from a single sheet of composite material, the thickness is typically uniform throughout both the vertical section and the angled section.

In addition to the outside, inside and planar units 24, 26, 28, the instant invention contemplates providing diverter units for a vast array of foundation shapes, including but not limited to radiused foundations or polygonal shapes. The invention contemplates providing customized units preformed to the specifications of a user, having such custom polygonal or radiused shapes. For example, where pier or post foundations are provided, alternative customized

shapes may be desireable. Where the soil in contact with the pier or post is saturated with water, it may freeze during cold weather, resulting in the ice attaching to the surface of the pier. As the water beneath the ice turns to ice, it heaves or lifts the ice above, as well as the pier that is strongly attached thereto. The amount of heave depends on the degree of saturation as well as on the severity of the freeze event.

Turning now to FIG. 9A, a post unit 66 coupled to a post foundation 68 is illustrated. Preferably, as illustrated in FIG. 9A, the post unit 66 is a single unit preformed to be coupled to a post foundation (not shown). However, it is anticipated that the post unit 66 may optionally include multiple sub-units as well. While the post unit 66 preferably includes a through-cut 68 to permit coupling to an existing post foundation, it is also anticipated that an uninterrupted post unit could be coupled to a post foundation during construction of the foundation. In the preferred embodiment, the through-cut 68 extends downwardly through the vertical portion 70 and angled portion 72 to permit coupling to the post foundation, wherein an angled portion of the post unit 66 includes sufficient surface area to provide for some lapping.

Turning now to FIG. 9B, the pier unit 74 preferably includes four preformed outside corner units 24. The pier unit 74 could optionally be preformed to omit through-cuts, and could thus be coupled to a pier foundation (not shown) during construction. Similar to the post unit 66, the pier unit 74 could also optionally include a single through-cut cut 76. The pier unit 74 preferably

includes multiple through-cuts 76, such as two through-cuts as illustrated in FIG. 9B, or such as four through-cuts.

Like the outside, inside, planar and pier units 24, 26, 28, 74, the post unit 66 may either be of unitary construction or assembled from a rubber such as recycled tire buffings in a polyethylene matrix, EPDM (ethylene propylene diene monomer) or neoprene. The invention contemplates use of other fabrication materials, such as polymeric materials like polyvinyl chloride (PVC), polyethylene, acrylonitrile butadiene styrene (ABS), polypropylene, as well as bitumen materials modified with styrene butadiene styrene (SBS) or atactic polypropylene (APP). Preferably, the post unit 66 may be preformed from the angled portion 72, which is preferably a generally circular inclined sub-unit, and a generally rectangular vertical panel that may be formed into the generally cylindrical shaped vertical portion 70. During assembly, the vertical portion 70 and the angled portion 72 interface generally at an outer circumference of the vertical portion 70 that has been formed to have a generally cylindrical shape, and are sealed together with neoprene or other adhesive.

The pier unit 74 may be preformed in a plurality of ways: as a single unitary unit by using a mold having a predetermined configuration, with multiple sub-units having a generally horizontal joint, or as a plurality of outside corner units 24.

Since post foundations 68 and pier foundations 74 do not typically extend to the same depths as a basement, for example, and because the inclemency

being protected against is frost heave rather than rainfall or other precipitation, the post and pier units 66, 74 preferably extend outwardly at a distance that is smaller than an outward extension of the angled portions 32 of the outside corner, inside corner and planar units 24, 26, 28. In one embodiment, for example, the post and pier units 66, 74 extend outwardly at a distance of about 16 inches with an upward extension of approximately 10 inches.

In the preferred embodiment, the outside corner unit 24, inside corner unit 26 and planar unit 28 are preformed from the same composite material, which is preferably a rubber such as recycled tire buffings in a polyethylene matrix, EPDM (ethylene propylene diene monomer) or neoprene. The invention contemplates use of other fabrication materials, such as polymeric materials like polyvinyl chloride (PVC), polyethylene, acrylonitrile butadiene styrene (ABS), polypropylene, as well as bitumen materials modified with styrene butadiene styrene (SBS) or atactic polypropylene (APP).

Preferably, each of the units 24, 26, 28 is preformed from a single piece of composite material. However, the instant invention contemplates embodiments wherein each unit 24, 26, 28 may be preformed from multiple sub-units. Ultimately, multiple methods of performing the diverter units 24, 26, 28 are contemplated, where once preformed, the diverter units are capable of ready installation. Where the diverter units 24, 26, 28 include multiple sub-units, the diverter units may be preformed to assume the same shapes and dimensions as

those preformed from a single piece of composite material, with junctions between the sub-units preferably sealed in a manner adequate to prevent or reduce leakage.

In the preferred embodiment the diverter units 24, 26, 28 are preformed from a single piece of composite material, as illustrated in FIGs. 7A and 7B. For example, FIGs. 7A and 7B illustrate a possible configuration for the outside and inside corner units 24, 26, where a 54" x 54" sheet of composite material is cut and folded. Cuts 80 are represented by solid lines, whereas folds 82 are represented by dotted lines. Preferably, the folds 82 that divide the vertical section 30 and angled section 32 are oriented with respect to one another at a slightly obtuse angle, such as at 92 degrees with respect to one another. The slightly obtuse angle promotes subsequent folding of the corner units 24, 26 to have a configuration wherein the angled section 32 and the vertical section 30 are disposed at a grade of approximately 20%. The planar unit 28 is also preformed from a single sheet of composite material that is folded but uncut.

More specifically, as illustrated in FIGs. 7A and 7B, in performing a preferred embodiment of the outside corner unit 24, two triangular shaped sections, which when combined form a generally square piece of material, are excised from the sheet of material. More specifically, a first generally triangular section is excised, and discarded, leaving a corresponding V-shaped cut-out section 84. A second triangular section 86 is also excised, either subsequent to or prior to the excision of the first triangular section. As illustrated in FIG. 7B, the second triangular section 86 is folded and coupled to the assembled outside corner

unit 24 over an area generally corresponding with the V-shaped cut-out section 84, preferably with the second triangular section overlapping at least a portion of the first and second portions 34, 36. The second triangular section 86 may be secured thereto in a variety of ways, such as with a preferred overlap of approximately 1 inch between the second triangular section and the cut-out 84 created by the excision of the first triangular section, and held together with an adhesive such as contact adhesive.

Alternatively, an additional strip of rubber 88, (best shown in FIG. 10) preferably uncured neoprene, may be coupled to the outside corner unit 24 and fastened with an adhesive. The strip of rubber 88 optionally includes a release paper having a tacky surface. A sheetgood surface to which the strip of rubber 88 is applied is preferably primed with an adhesive compound, subsequently allowed to "flash" for about 30 seconds, and then the sheetgood surface and the strip of rubber are mated. The resulting adhesive joint is considered in the art to be one of the better joints that include rubber compounds.

When a strip of rubber 88 is included in the assembled outside corner unit 26, assembly proceeds as illustrated in FIGs. 7A and 7B. As illustrated in FIG. 10, a piece of uncured neoprene is cut, preferably in a V-shape, with a thickness of each leg of the V-shape being between approximately 1 ½ and 2 inches. The second triangular section 86 is cut so that it generally corresponds to the hole created by the excision of the first triangular section 84. A bottom portion

of the V-shape is preferably cut to have a radius of approximately 1 inch, and is manipulated so that it flares outwardly.

Turning now to the inside corner unit 26 illustrated in FIG. 7C, this unit may be preformed in a variety of ways, such as from a single piece of material, with an overlap generally disposed at a corner joint 90 (best shown in FIG. 5) first and second portions 44, 46 meet. The inside corner unit 26 is preferably assembled by the cutting of sheet material as illustrated in FIG. 7C, and also including an additional strip of rubber (not shown), such as uncured neoprene. The strip of rubber preferably included in the inside corner unit 26 may assume numerous configurations, with one exemplary embodiment having a width of approximately 2 inches and a length of approximately 11 inches. The strip of rubber is preferably shaped to be generally horizontal at a top edge, but a generally semicircular shape at a bottom edge, where the semicircle includes an approximately 1-inch radius. The generally semicircular edge of the strip of rubber is manipulated so that a center of the semicircular edge is enlarged, while the circumference of the same end is preferably unchanged. A primer adhesive compound is subsequently applied to sheetgoods in an approximately 1-inch wide band along a side of each of the first and second portions 44, 46. Primer adhesive is also preferably applied at where a bottom point of the corner joint 90 meets the planar surfaces 50, 52, 54, and outwardly at a distance of about 1 inch.

Once formed, one or more of each of the outside corner, inside corner and planar units 24, 26, 28 may be installed around a building foundation

12. The units 24, 26, 28 may be installed atop bare prepared soil or alternatively over thermal insulating materials. FIG. 3 illustrates the outside corner piece 24 installed over thermal insulating materials 92. Using a thermal insulating material, such as polystyrene or high-density fiberglass, in connection with the diverter units 24, 26, 28 of the instant invention confers several additional advantages. First, soil, when excavated and replaced, loses some of its volume. Adding insulation under the diverter unit 24, 26, 28 compensates for this lost volume. Use of high-density fiberglass under the vertical section 30 of each unit 24, 26, 28 in particular is useful in applications by pest control operators to permit treatment chemicals to be placed beneath the angled portion 32, ensuring longer service life from the chemicals because they would not be leached out of the soil by slugs of rainwater washing the chemicals downward.

When applied on bare soil, the soil is preferably prepared by compacting the soil. While multiple methods of compacting the soil are anticipated, the soil is preferably compacted by impacting the soil, either once or multiple times with weighty implements. For example, a length of wood, such as a 4 x 4 length of wood may be elevated above the soil and released at a predetermined distance above the soil so that an end of the length of wood impacts the soil. Similarly, a steel pipe with a square foot attached may be elevated above the soil and released at a predetermined distance above the soils so that the foot impacts the soil. Also, a motorized plate tamper, such as the Dynapac LT74H

Vibratory Jumping Jack Plate Tamper manufactured by Metso Minerals, Ltd. of Helsinki, Finland may also be used for soil compaction.

Turning now to FIG. 3, an additional coupling mechanism is preferably provided to maintain placement of the diverter units 24, 26, 28 once installed. Accordingly, each diverter unit 24, 26, 28 is preferably provided with at least one termination bar 94 that includes a fastening mechanism. The termination bar 94 is generally rectangular in shape, and includes at least one orifice 96 through which a corresponding fastener 98 may be inserted. Each unit 24, 26, 28 is preferably provided with a number of termination bars 94 that corresponds to the number of portions included in the respective vertical section 30.

More specifically, the outside corner unit 24, which includes first and second portions 34, 36 within its vertical section 30, is preferably provided with two termination bars 94, one for each of the first and second portions. The inside corner unit 26, which includes first and second portions 44, 46 within its vertical section, and is therefore preferably provided with two termination bars 94. In contrast, the single portion that comprises the vertical section 30 of the planar unit 28 is preferably provided with a single termination bar 94.

Each termination bar 94 has a predetermined length that preferably corresponds to the length of the portion of the vertical section 30 to which it will be coupled. Thus, the outside corner unit 24 is provided with two termination bars 94, each having a predetermined length of approximately 24 inches. The inside corner unit 26 is provided with two termination bars 94, each having a

predetermined length of approximately 44 inches. The planar unit 28 is provided with a single termination bar 94 having a predetermined length of approximately 24 inches. Each termination bar 94 is coupled to an upper edge of the respective vertical portion. The fastener 98, such as a threaded fastener or a bolt, is then inserted into the respective orifice 96 and coupled to the foundation 12.

Alternatively, the termination bar 94 may optionally be provided in fractions of the lengths of the respective vertical section 30. For example, where the end user has specified that the planar unit 28 measure 8 feet, providing a corresponding length of termination bar 94 may be accomplished by providing several fractions of termination bar that total 8 feet. For example, four two-foot termination bars 94 could be provided with an eight-foot planar unit 28, which may ease manufacturing, packaging and shipping burdens.

While various embodiments of the present invention have been shown and described, it should be understood that other modifications, substitutions and alternatives are apparent to one of ordinary skill in the art. Such modifications, substitutions and alternatives can be made without departing from the spirit and scope of the invention, which should be determined from the appended claims.